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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/551,875

09/30/2005

Nobuo Ando

03702/0203436-USO

2041

7278 7590 05/07/2007
DARBY & DARBY P.C.
P. O. BOX 5257
NEW YORK, NY 10150-5257

EXAMINER

THOMAS, ERIC W

ART UNIT

PAPER NUMBER

2831

MAIL DATE

DELIVERY MODE

05/07/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/551,875	Applicant(s) ANDO ET AL.	
	Examiner Eric Thomas	Art Unit 2831	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-16 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) * | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) *
Paper No(s)/Mail Date <u>9/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-4, 6-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ando et al. (US 6,461,769) in view of JP 2001-085065 ('065).

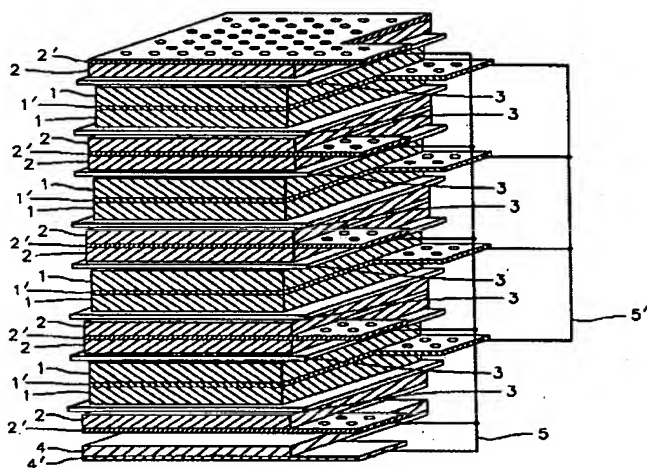


FIG. 1

Regarding claim 1, Ando et al. disclose in fig. 1, an organic electrolyte cell including a positive electrode (1), a negative electrode (2) and an electrolyte capable of transferring lithium ions,

wherein the positive electrode contains a substance capable of carrying lithium ions and/or anions reversibly as a positive electrode active material, the negative electrode contains a substance capable of carrying lithium ions reversibly as a negative electrode active material (abstract), and

wherein the positive and negative electrodes include the positive or negative electrode active material layer (bottom - 1, 2) on an electrode substrate (1', 2'), which has a through-hole that penetrates the front and rear surfaces (abstract), and the negative electrode electrochemically carries lithium ions.

Ando et al. disclose the claimed invention except for a conductive layer made of a conductive material on the electrode substrate.

'065 teaches that forming 2 μm thick adhesion layers that contain a conductive agent interposed between porous collectors and electrode layers improve the adhesion between the collectors and electrodes.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to form conductive layers on the electrode substrates of Ando et al., since such a modification would improve adhesion between the collectors and electrodes.

Regarding claim 3, Ando et al. disclose over 80% of the through holes of the current collectors are blocked with the conductive material.

Regarding claim 4, Ando et al. disclose the current collectors are made of either copper or aluminum as a main component (see col. 6 lines 51-67, and col 7 lines 1-20).

Regarding claim 6, Ando et al. disclose the electrolyte is an aprotic organic solvent solution of a lithium salt (abstract).

Regarding claim 7, Ando et al. disclose the capacitance per unit weight of the negative electrode active material is more than three times of the capacitance per unit weight of the positive electrode active material, and the weight of the positive electrode active material is larger than the weight of the negative electrode active material.

Regarding claim 8, Ando et al. disclose the organic electrolyte capacitor is formed by winding an electrode pair having the positive and negative electrodes (see fig. 7).

Regarding claim 9, Ando et al. disclose the organic electrolyte cell is formed by laminating electrode pairs having the positive and negative electrodes.

Regarding claim 10, Ando et al. disclose the negative electrode active material is a thermally treated aromatic condensation polymer, and an insoluble and infusible base having a polyacene skeletal structure in which hydrogen/carbon atomic ratio is in the range of 0.50 to 0.05.

Regarding claim 11, Ando et al. disclose the positive electrode active material is mesoporous carbon.

Regarding claim 12, Ando et al. disclose the current collectors have a thickness of 10 to 39 μm and a porosity of 10 to 90%.

Regarding claim 13, the modified Ando et al. disclose the thickness of the conductive layer on one surface of the positive electrode is in the range of 1 to 20 μm , the thickness of the positive electrode active material layer on one surface of the positive electrode is in the range of 50 to 175 μm , the total thickness of the positive electrode is in the range of 110 to 360 μm , the thickness of the conductive layer on one surface of the negative electrode is in the range of 1 to 20 μm , the thickness of the negative electrode active material layer on one surface of the negative electrode is in the range of 5 to 100 μm , and the total thickness of the negative electrode is in the range of 40 to 210 μm .

Regarding claim 14, the modified Ando et al. disclose the cell is used in an electric device.

Regarding claim 15, the modified Ando et al. disclose an electrode substrate that is coated with an electrode material containing an electrode active material and a binder to form electrodes, comprising: a conductive layer made of a conductive material that is formed on at least one surface of a current collector having through-holes that penetrate front and rear surfaces.

Regarding claim 16, the modified Ando et al. disclose a storage device including a positive electrode, a negative electrode, and an electrolyte capable of transferring lithium ions, wherein the positive electrode contains a substance capable of carrying lithium ions and/or anions reversibly as a positive electrode active material, wherein the negative electrode contains a substance capable of carrying lithium ions reversibly as a negative electrode active material, and wherein the positive and negative electrodes have conductive layers made of conductive materials on current collectors having through-holes that penetrate the front and rear surfaces, and have positive or negative electrode active material layer on the conductive layers.

5. Claims 1, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ando et al. (US 6,461,769) in view of JP 11-162787('787).

Regarding claims 1 and 5, Ando et al. disclose the claimed invention (see claim 1 above) except for conductive layers are made of a conductive material containing a conducting agent and a non-aqueous binder, the positive electrode active material layer contains the positive electrode active material and an aqueous binder, and the negative electrode active material layer contains the negative electrode active material and an aqueous binder.

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'787 teaches that forming adhesion layers comprising a conductive agent and a non-aqueous binder interposed between porous collectors and electrode layers improve adhesion between the collectors and electrodes.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to form conductive layers on the electrode substrates of Ando et al., since such a modification would improve adhesion between the collectors and electrodes.

'787 teaches the use of an aqueous binder in an electrode for an electrochemical element.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to form the electrodes of Ando et al. with an aqueous binder, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ando et al. (US 6,461,769) and JP 2001-085065 ('065) as applied to claim 1 above, and further in view of WO 2000/11688 ('688).

The modified Ando et al. disclose the claimed invention except for the positive electrode active material is mesoporous carbon.

'688 teaches that mesoporous carbon electrodes are known in the art.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to form the positive electrode of Ando et al. with mesoporous

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carbon, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Allowable Subject Matter

7. Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: The prior art does not teach or suggest in combination with the other claimed limitations, the electrode structure is a three-layer laminate including a first conductive layer that is made of a conductive material that has many through-holes on a surface of an imperforate metal foil (claim 2).

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

5,949,637 – Current collector comprising through-holes.

6,097,587 – Polarizable electrodes comprising through-holes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Thomas whose telephone number is 571-272-1985. The examiner can normally be reached on Monday - Friday 6:30 AM - 3:45 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on 571-272-1984. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ewt

 4-30-07

ERIC W. THOMAS
PRIMARY EXAMINER